SUPPRESSION OF THE $\gamma$-$\alpha$ STRUCTURAL PHASE TRANSITION IN Ce$_{0.8}$La$_{0.1}$Th$_{0.1}$ BY LARGE MAGNETIC FIELDS

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The $\gamma$-$\alpha$ structural transition in Ce$_{0.8}$La$_{0.1}$Th$_{0.1}$ has been measured as a function of applied magnetic field using both resistivity (33 T Bitter magnet, Tallahassee) and magnetization (60 T pulsed fields, Los Alamos). The transition temperature decreases with increasing magnetic field, reaching zero temperature at around 56 T (Figure 1) [1].

The magnetic-field dependence of the transition temperature is quantitatively reproduced by a model that invokes the field and temperature dependence of the entropy of the 4f-electron moments of the $\gamma$ phase [2].

Figure 1: Transition field versus transition temperature for the $\gamma$-$\alpha$ transformation in Ce$_{0.8}$La$_{0.1}$Th$_{0.1}$. Points are data and the lines are fits to the model of Ref. [1] (after [2]). (a) shows the remarkable and characteristic straight line relationship between the squares of the fields and temperatures (the so-called elliptical phase boundary [1]); (b) plots the same data in linear units.

References